

PORTABLE DISPENSER FOR DISPENSING FROZEN AERATED EDIBLE PRODUCTSTechnical field

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The present invention relates to a portable dispenser for dispensing frozen aerated edible products. The invention more particularly relates to a portable dispenser for dispensing ice cream.

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Background of the invention

Self contained portable dispensing devices for ice cream have been proposed for some time. A typical one is described in
15 WO95/16634 wherein such a device comprises a vessel for receiving and holding ice cream, said vessel being connected with a propellant and a discharge mechanism, and a pressurised container for the propellant, the whole device being contained within a housing mounted on the back of an operator.

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Such a device suffers from major shortcomings which means that it did not result in a commercially successful product.

In order to be actually operated, the discharge mechanism must be
25 situated on the front of the operator. Since the discharge mechanism is connected with the vessel in the back of the operator, it requires pipelines and articulated connections which are costly, difficult to maintain, and a huge hygiene hazard since they must be cleaned very properly everyday. Also, the
30 whole pipelines and connections must be properly thermally insulated.

There is thus a need for a device which does not require pipelines and connection through which ice cream would have to flow and which would go from the back of the operator to the front.

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It is now be found that by disconnecting the functions of storage and discharge, it is possible to achieve this goal.

Portable coolers for a number of beverage cans are known (See for
10 example US4721237). Dispensing means for discharging viscous
products from cartridges are known (See for example WO01/60173,
EP369723, WO97/42096, US5893485 and US5918767). However it has
not been proposed to provide a portable dispenser for dispensing
frozen aerated edible product from a single dose cartridge which
15 is easy to use (preferably one-handed) and which dispenses the
product in a hygienic manner.

Definitions

20 "Insulated storing means" shall mean storing means with insulated
walls, said insulated walls containing an insulating material
having a thermal conductivity in the range of about 0.5 to about
75, preferably about 0.5 to about 50 milliWatt (metre Kelvin)⁻¹.
The insulated material can be, for example, polystyrene,
25 polyurethane, fibreglass, or vacuum.

"Cooling means" shall mean containers containing a phase change
material with a thermal capacity of between about 150 and about
300 kiloJoule/ kg over a temperature range of -25 to -5°C.
30 Preferably the phase change material is a eutectic material.

"Independent" shall mean without pipe connection through which
frozen aerated product can be transferred.

"Single-handed actuated" shall mean that the dispensing means filled with a single dose cartridge can be carried and the ice cream can be dispensed using a single hand, leaving the other
5 hand free for other purposes.

Brief description of the invention

It is the object of the present invention to provide a portable
10 dispenser for dispensing frozen aerated edible product from single dose cartridges containing said frozen aerated edible product, said dispenser comprising;

- 15 • Thermally insulated storing means for storing single dose cartridges containing said frozen aerated edible product, said thermally insulated storing means being adapted to be mounted on the back of a person, and
- 20 • Dispensing means capable of holding a single dose cartridge containing said frozen aerated edible product outside the storing means, said dispensing means comprising discharge means capable of discharging frozen aerated edible product out of said single dose cartridge.

By using single dose cartridges, the dispensing means are only in
25 two positions, full or empty. If the cartridge was a multi dose one, serious hygiene problems would still exist, particularly at the end of a vending session since the question of what to do with the product remaining in the cartridge in the dispensing means would immediately occur. Also since an undefined time can
30 occur between two sales, having a multi dose cartridge in the dispensing means would necessitate further thermal insulation of said dispensing means.

Preferably, in the portable dispenser according to the invention, the dispensing means are independent from the storing means. It particularly means that the source of energy required for activated the discharge means is with the dispensing means
5 itself.

Preferably also, the dispensing means are adapted to be mounted on the front of the person.

10 Most preferably, the dispensing means are single-handed actuated. It means that the operator can use his other hand, for example to hold a cup or a wafer cone into which the ice cream is going to be discharged.

15 Preferably the thermally insulated storage means are such that the temperature of thirty cartridges containing frozen aerated edible product stored within the storing means rises less than 5 degrees Celsius in a period of 1.5 hours when the ambient temperature outside the storing means is about 30°C. Most
20 preferably also the thermally insulated storing means contains cooling means which allow the frozen products inside to be kept at the right temperature for at least about 4 hours.

Most preferably also, the thermally insulated storing means
25 comprises delivery means adapted to deliver individual single dose cartridges containing frozen aerated edible product. This allows for minimum re-heating when a cartridge is taken out of the storing means.

30 In an even more preferred embodiment of the invention delivery means are situated at a bottom of the storing means. This allows for the cartridges to be individually delivered by gravity.

Preferably, the single dose cartridges are frusto-conical. It allows for easy stacking one in the other once they have been emptied. In another embodiment also addressing the issue of disposing of and stacking the used cartridges, the discharge means comprise cartridge opening means which create at least one longitudinal cut or breaking line on the surface of the cartridge thus allowing for an easy stacking of cylindrical cartridges.

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Detailed description of the invention

The present invention will be further described with reference to the accompanying drawings wherein:

Figure 1 represents a 3D schematic view of storing means according to the invention.

Figure 2 represents a 3D exploded view of storing means according to the invention.

Figure 3 represents a schematic view illustrating the delivery means in operation.

Figure 4 represents a schematic exploded 3D view of dispensing means according to the invention.

As it can be seen in Figure 1, thermally insulated storing means 1 are typically constituted by a harness 2 and a thermally insulated casing 3. This harness is adapted to fit on the back of an operator. Near the bottom of this thermally insulated casing are two delivery means 4 adapted to individually deliver single

dose cartridges 5. The harness can also be fitted with a wafer cone holder not represented, from which individual cones will be taken and into which ice frozen aerated product contained in single dose cartridges will be dispensed.

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Single dose cartridges can be cylindrical cartridge as described in WO 01/19205. In a preferred embodiment they are frusto conical. It allows for an easy stacking of used cartridges 5 one into another.

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As illustrated in Figure 2, storing means 1 typically comprised by a carrying shell 6, secured to the harness 2, and a rear cover 7. Between the carrying shell 6 and the rear cover 7 is located an insulating box 8, the inside of it being adapted to receive a

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cartridge cascade mechanism 9 which when put inside the insulated box is further covered by a rear insulating panel 10 made from a thermally insulating material generally similar to the one constituting the box 8. All these elements constituting the storing means are maintained together by elastic straps 11.

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Between the insulated box 8 and the cascade mechanism 9 are preferably disposed cooling means 12, indicated in phantom lines on Figure 2, which are preferably situated at the top of the cascade mechanism 9 and on its two lateral sides perpendicular to the carrying shell 6 and the rear cover 7 but which can also, in a less preferred embodiment, be located as disclosed on Figure 2. The cooling means 12 are preferably in the form of plastic containers filled with a suitable phase change material, preferably a eutectic material..

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Near the bottom of the insulating box 8 are two openings 17, each of them adapted to let an individual cartridge, located in the cartridge cascade mechanism 9, entering delivery means 4. The presence of two delivery means 4 allows for the cascade mechanism

to be loaded with two different type of cartridges, each type corresponding, for example to a different flavour.

As illustrated in Figure 2, the delivery means 4 typically
5 comprises a tumbler 13 made from an insulating material,
preferably similar to the one used for the box 8 and the panel
10, e.g. polyurethane foam. This tumbler 13, is covered by a
plastic shell 14, the shell 14 presents an opening 15 adapted to
correspond with a cartridge well 16 in the tumbler 13. The
10 tumbler 13 together with its shell 14 is mounted rotatable around
an axis parallel to the axis of the cartridges located in the
cartridge cascade mechanism 9.

As illustrated in Figure 3, in order to take a single dose
15 cartridge out of the storing means, the tumbler 13 is put in a
position wherein an individual cartridge 5 is allowed to enter
into the cartridge well 16. The tumbler is then rotated and the
cartridge is allowed to fall from the tumbler onto a cartridge
chute 18 described on Figure 2.

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As illustrated in Figure 4, dispensing means 20 with an electric
motor 21 connected to a battery 22 and adapted to actuate a
dispensing pusher 23 inside a casing 24 into which a cartridge
(not represented) has been first introduced. A switch mechanism
25 (not represented) activates the motor 21. This dispensing means
is adapted to be hold and activated by a single hand.

The operation of a device according to the invention is now going
to be disclosed.

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Before a vending session begins, the storing means are opened.
Straps 11 are released and the rear cover 7 together with the
insulating panel 10 are removed. Then either a new cascade

mechanism 9, full with single dose cartridges is put in place of the old one or the rear panel 19 of the cascade mechanism 9 is removed and new cartridges are put manually in the cascade 9. Once it is completed, new cooling means 12 are introduced and
5 fitted. The insulating panel 10 and the rear cover 7 are put back in place and the straps 11 are re-fitted.

If necessary a new battery 22 is fitted and the whole system is ready for use.

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During a vending session, on demand, delivery means 4 are actuated and a single-dose cartridge 5 containing is removed from the thermally insulated casing 3. This cartridge 5 is then introduced in the dispensing means 20 and the motor 21 is
15 activating leading to the ice cream to be discharge from the cartridge into a chosen container which can be, for example, a wafer cone.

At the end of a vending session, the storing means are opened,
20 cooling means 12 are removed and stored into a freezer for 're-loading' and the unused single dose cartridges are removed and put into an appropriate freezer for storage until a further vending session.